

DIPTERA OF AUSTRALIA.

BY FREDERICK A. A. SKUSE.

PART IV.—THE SIMULIDÆ AND BIBIONIDÆ.

(Plate XXXIX.)

The families Simulidæ and Bibionidæ conclude the first subdivision of the Nematocera; the former contains only the single genus *Simulium*, Latr., while the latter embraces several genera distributed amongst the four groups—Bibioninæ, Hesperinæ, Lobogastrinæ, and Scatopsinæ. All the known Australian Bibionidæ are referable to the first and last of these. Judging from the material before me, neither of these families appears well represented in this country, but it is more than probable that the number of exponents known to me is very far from exhaustive. Eleven species of *Bibio* stand recorded from Australia, but the descriptions of six of these—five by Macquart and one by Jænnicke—are unfortunately not accessible to me at present; four of the remaining five are certainly only different names for the same species; while the fifth, that of *B. substitutus*, Walk., is much too vague to be of much service for identification. *B. imitator* is widely distributed in Australia, and it occurs also in New Zealand; but I have seen no other species of this genus in the country. In *B. fulvipes*, Macquart has described the male, and in *B. ruficoxis* the female of *B. imitator*, characterised by Walker in 1835. *B. helioscops*, Schiner, is identical with the male of the latter species. *Plecia dimidiata* and *Dilophus longirostris*, Macq., both of which are now re-described, complete the sum of the hitherto known Australian Bibionidæ. To these I add descriptions of three very distinct species of *Plecia*, one of *Dilophus*, and two of *Scatopse*.

The generic diagnoses hereafter given are necessarily incomplete, since the works of authors subsequent to Macquart, containing these in a more detailed and improved form are not at hand for reference, if indeed in the country. Therefore, without generalizing on the strength of the meagre and local material at my disposal, I have been compelled to adopt the only alternative, to minutely describe individual species, and point out some of the apparent discrepancies in the old descriptions.

SIMULIDÆ.

Genus 1. SIMULIUM, Latr.

Simulium, Latreille, Hist. Nat. Crus. et Ins. XIV. 1804, p. 294; Meigen, Syst. Besch. I. 1818, p. 289; Macquart, S. à B. Dipt. I. 1834, p. 173, etc.

“Fourth joint of the palpi a little elongated and slender. Antennæ cylindrical, 11-jointed; the two first joints separated from the others. Eyes round. Ocelli wanting. First joint of the tarsi as long as the others taken together. Wings very broad; basal and marginal cells very narrow.”

Obs.—There are only four joints to the palpi. In the following species it will be seen from the description that the palpi differ from those of *S. trifasciatum*, Curt., (Brit. Ent. XVI. 1839, p. 765), and Meigen's description, particularly in the length of the last joint. Latreille, Meigen, Macquart, and Curtis, in their diagnoses of this genus, all describe the antennæ as composed of 11 joints, and Meigen and Curtis have both illustrated this by figures, but in the following, which is a peculiar exception in this respect, the number is only 2+8 joints. The number of abdominal segments is eight, the last one small,

This genus is known from many parts of the world, and occurs in all climates. The insects are generally known by the name of “sand-flies,” and being provided with a fully developed mouth,

are, like the mosquitoes, very tormenting to mankind and the lower animals. In South America one or more species of *Simulium* goes by the name of "mosquito." In North America it is called the "black fly." *Simulium columbatschense*, Sch., seems to be the most dreaded species; it inhabits Hungary, and cattle are said to sometimes succumb to its attacks. Hagen (E. M. Mag. Vol. XIX. No. 227, p. 254) notes a N. American species which feeds upon the blood of the chrysalids of a species of butterfly (*Pieris menapia*).

I have only twice found specimens of the following described species, and then only in very limited numbers, and I know no other instance of its capture. It seems rare and local. The so-called "sand-fly" of this country is a species of *Ceratopogon*, or probably more than one species, only too abundant in many places, and inflicting very painful "bites."

The larvæ of Simulidæ are aquatic.

173. SIMULIUM FURIOSUM, sp.n. (Pl. XXXIX., fig. 1).

♀.—Length of antennæ.....	0·017 inch	...	0·42 millimètre.
Expanse of wings.....	0·095 × 0·045	...	2·39 × 1·13
Size of body.....	0·080 × 0·025	...	2·02 × 0·62

Antennæ short, black, densely covered with a microscopic hoary pubescence; 2-+8-jointed, second joint of the scapus twice the length of the first, first flagellar joint about as large as the second joint of the scapus, three following short, next three large, terminal joint elongate-ovate (fig. 1b.). Head, hypostoma, and palpi black, with a minute yellowish pubescence, very dense on the latter; joints of the palpi as follows: first joint small, second twice the length of the first, stout, elongate-ovate, third somewhat shorter than the second, more slender, claviform, a little emarginate on the inner side near the apex, fourth joint somewhat longer than the second, slender, sub-cylindrical, a little dilated towards the apex (fig. 1a.). Eyes deep black. Thorax black, opaque, indistinctly

divided by three striæ, beginning below the anterior margin and terminating before the scutellum; rather densely covered, more especially anteriorly, with a microscopic pale yellow pubescence; pleuræ, pectus, scutellum, and metathorax black, opaque. Halteres pallid, the base of the stalk black, with a minute pale pubescence. Abdomen black, opaque, the third to the seventh segment with a square median patch of intense black, densely clothed with short hairs. Legs brownish-black, with a pale yellow pubescence, interspersed with longer hairs; genua yellow; metatarsus of the hind-legs nearly twice the length of the four following tarsal joints, and longer than the tibiæ of the intermediate- or fore-legs. Wings longer than the entire body, hyaline, brownish at the root; costal vein black, auxiliary and first two longitudinal veins sordid yellowish-brown; third, fourth, fifth, and sixth longitudinal veins pale. First and second longitudinal combining with the costa before the tip of the fourth longitudinal vein; tip of the costal vein nearer the apex of the wing than the tip of the anterior branch of the fork of the third longitudinal; marginal cross-vein about as long as the petiole of the second sub-marginal cell. Wing-fold between the third and fourth longitudinal veins furcate before joining the posterior border; wing-fold between the fifth and sixth longitudinal veins nearer the former, bent abruptly forward at its tip, and joining the wing-border very close to the tip of the fifth longitudinal vein; sixth longitudinal vein complete.

Hab.—Gosford and Berowra (Skuse). August and September.

BIBIONIDÆ.

Genus 1. BIBIO, Geoff.

Bibio, Geoffroy, Ins. II. 1764, p. 571, 3; *Hirtea*, Fabricius, Zetterstedt, etc.; *Bibio*, Meigen, Syst. Besch. I. 1818, p. 309; Macquart, S. à B. Dipt. I. 1834, p. 177, etc.

“Head almost entirely occupied by the eyes in the ♂; small, elongated, and inclined in the ♀. Proboscis projecting; terminal labella indistinct; labrum and tongue ciliated towards the extremity. Palpi 5-jointed; first joint very small. Antennæ cylindrical, perfoliated, inserted under the eyes, 9-jointed; two first joints separated from the others, the rest very short. Eyes hairy in the ♂, naked, small and a little prominent in the ♀. Abdomen terminated with two hooks and two tubercles in the ♂. Legs hairy; fore femora short, dilated in the ♀; hind pair elongated in the ♂; tibiæ grooved; fore pair short, dilated, terminated by a long and a short spine; posterior pair dilated in the ♂. Joints of the tarsi elongated; three pulvilli at the extremity. Two basal cells to the wings.”

Obs.—Macquart does not mention in the above that *Bibio* has three ocelli, and he says nothing about the shape of the joints of the palpi. In *Bibio imitator* these are as follows: First joint very small, second cylindrical, the width and nearly three times the length of the first, third robust, obovate, as long as the second, fourth rather shorter and not as wide, somewhat claviform, fifth joint rather more slender but about the length of the last, somewhat claviform. This pretty well agrees with the diagnosis given by Curtis (Brit. Ent. Vol. 3, 1826, p. 138) from dissections of *B venosus*. Meigen, Curtis, and Macquart all pronounce the number of joints of the antennæ to be nine, and the first two authors have carefully figured these organs, but in both ♂ and ♀ specimens of *B. imitator* there are distinctly 2- + 8-joints, the last joint somewhat smaller than the one preceding it, though by no means so insignificant as to be liable to be overlooked by anyone who examined the antennæ. The first flagellar joint in *B. imitator* is as large as either joint of the scapus, the remainder short and transverse. Abdomen with eight segments. There is great diversity usually in the sexes.

The females deposit their eggs in the ground or in dung, where the larvæ feed and the transformations take place. The full-grown insects are sluggish in their movements, and are found

commonly upon fruit-trees and on flowers. Sometimes called "garden-flies." The genus is of world-wide distribution.

174. BIBIO IMITATOR, Walker. (Pl. xxxix., fig. 2, ♂).

Bibio imitator (♂ and ♀), Walk., Entom. Mag. II. 1835, p. 470; *B. fulvipennis* (♂) and *B. ruficoxis* (♀), Macquart, Diptères Exotiques, 4th Suppl. 1850, p. 17, Nos. 10 and 11; *B. helioscops* (♂), Schiner, Diptera der Novara-Expedition, Zool. Theil, Band II. p. 20, No. 8.

♂.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expause of wings.....	0·220 × 0·075	...	5·58 × 1·89
Size of body.....	0·270 × 0·055	...	6·85 × 1·39
♀.—Length of antennæ.....	0·030 inch	...	0·76 millimètre.
Expause of wings.....	0·290 × 0·110	...	7·35 × 2·79
Size of body.....	0·285 × 0·070	...	7·22 × 1·77

♂.—Antennæ much shorter than the head, moderately robust, dull black, 2-+8-jointed, densely covered with a minute pubescence, which has an almost hoary reflection in a certain light. Head, ocelli, and palpi black; the former as wide as the thorax. Eyes black (or having a dull cupreous-red appearance after death), beset with minute black hairs. Thorax black, nitidous, densely covered with golden-yellow hairs; line dividing the collare and mesothorax, towards the humeri, and posterior margin between the scutellum and origin of the wings, tinged with ochraceous (this colour is not so distinct or scarcely perceptible in some specimens); scutellum rather densely covered with golden-yellow hairs. Halteres ochraceous. Abdomen flattened, at the base about the width of the thorax, twice the length of the latter, sub-linear, black, opaque, nitidous between the segments, clothed with pale yellow hairs, the latter most numerous on the first two segments; forceps not the width of the

terminal segment, black, distinct. Legs black, nitidous, densely pubescent; mucrones of the fore tibiæ and tibial spurs of all legs deep brown; pulvilli pallid. Wings the length of the thorax and abdomen taken together, pale smoky-brown, darker anteriorly; stigma tolerably distinct; base of wings and veins ochraceous; the costal, first two longitudinal veins, and marginal cross-vein darker, and the middle cross-vein paler than the rest. Sub-costal cross-vein very indistinct. Third longitudinal vein originating a short distance before the marginal cross-vein, its posterior branch not quite reaching the wing-margin; petiole of the fork twice the length of the marginal cross-vein; middle cross-vein joining the third longitudinal at or somewhat beyond the base of the fork; fourth longitudinal vein very stout; anterior branch of the fourth longitudinal detached at its base and not quite reaching the wing-margin; fifth longitudinal rudimentary.

♀.—Antennæ rather longer and stouter than those of the ♂, in other respect similar. Head narrow, brown or ferruginous-ochraceous, with golden-yellow hairs. Eyes, ocelli, palpi and proboscis black; the former beset with microscopic hairs. Thorax ferruginous-ochraceous, nitidous, densely covered with golden-yellow hairs. Halteres ochre-yellow. Abdomen robust, the width of, or somewhat wider than the thorax, about twice its length, ochre-yellow, nearly opaque, clothed with pale yellow hairs; lamellæ of the ovipositor ochre-yellow. Coxæ and trochanters ferruginous-ochraceous, nitidous. Femora,* tibiæ and tarsi black, nitidous, densely pubescent; mucrones of the fore tibiæ, and tibial spurs of all legs brown; pulvilli pallid. Wings a little longer than the abdomen, smoky-brown, considerably darker than those of the ♂; stigma distinct; base ochraceous; veins smoky-ochraceous. Sub-costal cross-vein very indistinct. Marginal cross-vein $\frac{3}{4}$ the length of the petiole of the fork of the

* In dried specimens the genua generally assume a ferruginous-ochraceous tinge.

third longitudinal; middle cross-vein joining the third longitudinal a little beyond the base of the fork; the rest as in the ♂.

Hab.—New Holland (Walker); ♂, East coast of New Holland, ♀, Tasmania (Macquart); ♂, Sydney (Novara Exp.), common (Masters and Skuse); Knapsack Gully, Blue Mountains (Masters); Saddleback Mountain, near Kiama (Skuse); also New Zealand (Novara Exp.). September to January. Many specimens taken *in copulâ*.

Obs.—This is without doubt the *B. imitator* of Walker, and most probably also his *B. substitutus*, but the description of the latter is too imperfect to be of any use. Schiner's *B. helioscops* only differs in the colour of the halteres, but surely that is scarcely sufficient to constitute more than a mere variety; in many of my specimens the halteres are tinged with black, but this I attribute to their age. Macquart has described each sex under a different name evidently because he received his specimens from two distinct localities.

175. BIBIO SUBSTITUTUS, Walker.

B. substitutus, Walk., List. Dipt. Brit. Mus. 1848, Part I. p. 121.

“♀.—*Lutea, capite piceo, antennis pedibusque nigris, coxis luteis, alis nigro-fuscis.*

“Body orange; head piceous; feelers and eyes black; legs black; hips orange; wings dark brown; brands indistinct; fore border veins brown, the other veins tawny; poisers orange. Length of the body 3 lines, of the wings 7 lines.

“New Holland.”

176. BIBIO MARCI, Geoffr.

B. Marci, Geoffroy, Hist. Nat. des Ins. II., 1764, p. 571, 3; Loew, Linn. Entom. I. 1846, p. 343, 2.

♂ specimens completely resembling those of Europe were found by Macquart amongst the Diptera collected on the east

coast of Australia by M. Verreaux (Dipt. Exot. 4th Suppl. 1850, p. 18), but I have not yet discovered specimens.

The descriptions of (177) *B. clavatus*, Macq.; (178) *B. nigrithorax*, Macq.; (179) *B. serricornis*, Macq.; (180) *B. rufiventris*, Macq.; (181) *B. rubiventris*, Macq.; and (182) *B. elegans*, Jænnicke, recorded from Australia in Walker's "Notes on Diptera (1874)," are at present inaccessible to me. It would not surprise me if most of these eventually prove synonymous with *B. imitator*. I have specimens of the latter which might well be called *clavatus*, *nigrithorax*, *rufiventris* or *rubiventris*. If in killing, the ♀ be left too long in the chloroform bottle, all the bright colouring disappears, and the abdomen assumes a black appearance.

Genus 2. PLECIA, Wied.

Plecia, Wiedemann, Auss. Zw. I. 1828, p. 72; Macquart, S. à B. Dipt. I. 1834, p. 175, etc.

"Head small, hemispherical, not so wide as the thorax in the ♀. Proboscis projecting, thick. Labrum rather large, pointed. Palpi five-jointed; first joint small; third large, conical. Face as long as the front, convex, projecting to the upper part. Front rather wide, carinated in the ♀. Antennæ perfoliated, inserted a little lower than the middle of the eyes, 11-jointed; the first two joints short, cylindrical, little separated from one another; third rather large, cyathiform, a little elongate; the following joints short, a little rounded, diminishing somewhat in size; the last very small. Eyes convex, rounded. Thorax with two indented lines. Legs nearly naked; fore-legs: femora elongated, dilated at the apex; tibiæ elongated; first joint of the tarsi a little elongated; the rest rather short. Wings once longer than the abdomen in the ♀; two basal cells; two marginal ♀; second posterior cell petiolated."

Obs.—I must remark here that the above number of antennal joints cannot be taken as a generic character, as in the appended descriptions it will be seen that although *P. amplipennis* ♀, has

2-+9-joints, *P. ornaticornis* has 2-+8-joints in the ♂, and 2-+9-joints in the ♀, *P. erebea* 2-+8-joints in both sexes, and lastly *P. dimidiata* 2-+6- also in both sexes. In all these cases the first joint of the flagellum (or as Macquarts puts it the "third joint" of the antennæ) is larger than any other, and the terminal joint is always extremely small and nipple-shaped. As Macquart was the original describer of *P. dimidiata*, he should have drawn attention to the deficiency of joints. Possibly describers are two apt sometimes to take things for granted. The palpi are much longer than the antennæ. Abdomen with eight segments.

The number of known species belonging to this genus is small. It does not appear to be represented in Europe, and the majority of examples have been described from South America, Asia and Eastern Isles.

183. *PLECIA AMPLIPENNIS*, sp.n. (Pl. xxxix, fig. 3.)

♀.—Length of antennæ.....	0.045 inch	...	1.13 millimètres.
Expans of wings.....	0.390 × 0.140	...	9.89 × 3.55
Size of body.....	0.300 × 0.070	...	7.62 × 1.77

Antennæ the length of the head, dull black, densely covered with a minute pubescence, 2-+9-jointed, all the joints furnished with very short verticils. Head, ocelli, and palpi dull black. Eyes dull black or purplish-black, beset with minute hairs. Thorax, pleuræ, pectus, scutellum, and metathorax entirely of a uniform bright ochreous or ferruginous-ochreous, opaque, with no pubescence. Halteres long, black, the base of the stem ochreous or ferruginous-ochreous, with a minute pubescence. Abdomen about the width and more than twice the length of the thorax, black, almost opaque, somewhat shining, densely clothed with short black hairs; ovipositor short. Legs black, except the coxæ which are brown, nitidous, densely pubescent; tibial spurs black; pulvilli yellow. Wings longer than the body, smoky-brown inclining to fuscous, darker anteriorly; stigma tolerably

distinct; veins umber-brown. Costal vein extending beyond the tip of the second longitudinal vein rather more than one-third the distance from that to the tip of the anterior branch of the third longitudinal fork; auxiliary vein reaching the costa immediately before the base of the third sub-marginal cell, united to the first longitudinal at the tip of the marginal cross-vein by an indistinct sub-costal cross-vein; first longitudinal vein joining the costa opposite the middle of the anterior branch of the second longitudinal vein; anterior branch of the second longitudinal vein sinuous; marginal cross-vein perfectly straight, twice, or rather more than twice, the length of the petiole of the third sub-marginal cell; branches of the third longitudinal fork not very divergent, the anterior branch bent posteriorly towards its tip; middle cross-vein originating near the base of the anterior branch of the fourth longitudinal fork, joining the second longitudinal vein opposite or imperceptibly beyond the tip of the marginal cross-vein; tip of the anterior branch of the fourth longitudinal fork bent inwards; fifth longitudinal vein complete, meeting the tip of the posterior branch of the fourth longitudinal vein on the wing-margin.

Hab.—Cairns, Northern Queensland (Froggatt).

Var. β.—Three ♀ specimens differ from the above in having dark, fuliginous wings (in two instances these are much larger than the above measurements), and the fifth longitudinal vein terminates on the wing-border a little before the tip of the posterior branch of the fourth longitudinal fork.

Hab.—Barron and Mulgrave Rivers, Northern Queensland (Froggatt).

Var. γ.—A ♀ specimen with rather pale wings, the fifth longitudinal vein terminating on the wing-border at the tip of the posterior branch of the fourth longitudinal fork, and having the legs of reddish-brown colour.

Hab.—Port Denison (Froggatt).

Obs.—A ♂ specimen in the Macleay Museum from Eramanga, New Hebrides, is not distinguishable from the last variety. Some smaller ♂ and ♀ examples from New Guinea only differ from the Eramanga variety in having blacker legs, and the fifth longitudinal vein joining the wing-border a little before the tip of the posterior branch of the fourth longitudinal vein.

184. *PLECIA ORNATICORNIS*, sp.n. (Pl. XXXIX., fig. 4, ♂).

♂.—Length of antennæ.....	0.030 inch	..	0.76 millimètre.
Expause of wings.....	0.230 × 0.080	...	5.84 × 2.02
Size of body	0.230 × 0.040	...	5.84 × 1.01
♀.—Length of antennæ.....	0.040 inch	...	1.01 millimètre.
Expause of wings.....	0.280 × 0.100	...	7.10 × 2.54
Size of body	0.230 × 0.045	...	5.84 × 1.13

♂ and ♀.—Antennæ in the ♂ shorter than the head, 2- + 8-jointed, in the ♀ as long as the head, 2- + 9-jointed, in both cases the terminal joint exceedingly small and nipple-shaped, densely covered with a minute pubescence, all the joints with very short verticils; first joint of the scapus and all the flagellar joints fuliginous, the second joint of the scapus ochraceous. Head, eyes, ocelli and palpi dull black; eyes in the ♀ beset with minute black hairs. Thorax, pleuræ, pectus, scutellum and metathorax entirely of a uniform bright ochreous, opaque, with no pubescence. Halteres long and slender, black, the base of the stalk ochreous-yellow, with a minute pubescence. Abdomen black, almost opaque, somewhat shining, densely clothed with black hairs; in the ♂ more slender than the thorax, and about twice its length, in the ♀ as wide as, and twice the length of, the thorax; ♂ forceps small; ♀ ovipositor short. Legs black except the coxæ, the latter ochreous nitidous, densely covered with black hairs; tibial spurs black; pulvilli pallid. Wings smoky-brown inclining to tuscous, somewhat darker anteriorly; in the ♂ as long as the

entire body, in the ♀ longer; stigma not noticeable; veins umber brown. Costal vein extending beyond the tip of the second longitudinal vein, in the ♂ one-third and in the ♀ nearly half the distance from that to the tip of the anterior branch of the third longitudinal fork; auxiliary vein reaching the costa almost opposite, but immediately before in the ♂, and in the ♀ exactly opposite, the base of the third submarginal cell; first longitudinal vein joining the costa beyond the middle of the anterior branch of the second longitudinal; anterior branch of the second longitudinal vein a little arcuated at its base; marginal cross-vein a little bent, twice the length of the petiole of the third submarginal cell; branches of the third longitudinal fork gradually divergent; middle cross-vein very distinct, originating near the base of the anterior branch of the fourth longitudinal fork, joining the second longitudinal vein in the ♂ opposite, in the ♀ a little beyond, the tip of the marginal cross-vein; branches of the fourth longitudinal considerably divergent towards their tips; fifth longitudinal vein complete, reaching the border a short distance behind the posterior branch of the fourth longitudinal vein.

Hab.—Cairns and Barron River, Northern Queensland (Froggatt).

185. *PLECIA EREBEA*, sp.n. (Pl. xxxix., fig. 5, ♂).

♂.—Length of antennæ.....	0·025 inch	...	0·62 millimètre.
Expanses of wings.....	0·200 × 0·070	...	5·08 × 1·77
Size of body.....	0·200 × 0·035	...	5·08 × 0·88
♀.—Length of antennæ.....	0·030 inch	...	0·76 millimètre.
Expanses of wings.....	0·250 × 0·090	...	6·35 × 2·27
Size of body.....	0·220 × 0·040	...	5·58 × 1·01

♂ and ♀.—Wholly black. Antennæ rather robust, in the ♂ shorter than the head, in the ♀ about the length of the head, 2 + 8-jointed, densely covered with a minute pubescence, all the joints with very short verticils. Eyes not beset with hairs.

Thorax nitidous, with two longitudinal treble or quadruple rows of very short blackish hairs from the humeri to the scutellum; pleuræ and pectus dull. Halteres long and slender, with a minute pubescence. Abdomen somewhat shining, densely pubescent, more so in the ♂ than the ♀; in the ♂ about the width of the thorax, not twice its length, more robust and rather longer in the ♀; ♂ forceps small; ♀ ovipositor short. Legs densely pubescent, particularly those of the ♂; tibial spurs black; pulvilli pallid. Wings dark smoky-brown, darker anteriorly, in the ♂ as long as the body, in the ♀ longer; stigma indistinct; veins umber-brown, the costal, auxiliary, first and second longitudinal, and marginal cross-vein darker than the rest. Costal vein extending beyond the tip of the second longitudinal vein, in the ♂ one-third and in the ♀ about half the distance from that to the tip of the anterior branch of the third longitudinal fork. Auxiliary vein joining the costa over the base of the third sub-marginal cell; first longitudinal vein joining the costa before the base of the anterior branch of the second longitudinal; marginal cross-vein arcuated posteriorly at its tip, its base situated somewhat before the tip of the posterior branch of the fourth longitudinal; petiole of the third sub-marginal cell appearing as a direct continuation of the basal portion of the second longitudinal vein, more than half the length of the marginal cross-vein; branches of the third longitudinal fork widely divergent; middle cross-vein originating near the base of the anterior branch of the fork of the fourth longitudinal vein, joining the second longitudinal vein at a point as much before the marginal cross-vein as the base of the third sub-marginal cell is beyond it; fifth longitudinal vein complete.

Hab.—Lawson, Blue Mountains (Masters). January.

186. PLECIA DIMIDIATA, Macquart. (Pl. xxxix., fig. 6, ♂).

P. dimidiata (♂), Macq., Diptères Exotiques, Suppl. 1846, p. 20, No. 6, pl. 2, fig. 8.

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètres.
Expanse of wings.....	0·180 × 0·060	...	4·56 × 1·54
Size of body.....	0·210 × 0·035	...	5·33 × 0·86
♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètres.
Expanse of wings.....	0·250 × 0·090	..	6·35 × 2·27
Size of body.....	0·230 × 0·045	...	5·84 × 1·13

♂ and ♀.—Antennæ much shorter than the head, moderately robust, stouter in the ♀ than in the ♂, dull black, densely covered with a minute pubescence, 2-+6-jointed, all the joints with very short verticils. Head, eyes, ocelli and palpi black, the eyes not beset with hairs. Thorax ferruginous-ochraceous, nitidous, the anterior portion,* from immediately below the humeri in the ♂, only very slightly on the anterior border in the ♀, dull black; no visible pubescence when viewed with an ordinary lens; pleuræ black, in the ♀ with a scarcely perceptible reddish tinge; scutellum ferruginous-ochraceous, more or less tinged with black in the ♂; pectus black; mesothorax black, the metanotum in the ♀ ferruginous-ochraceous. Halteres black, the stem long and slender. Abdomen black, somewhat shining, densely covered with black hairs; in the ♂ rather more slender than the thorax and twice its length, rather longer and more robust in the ♀; ♂ forceps small, not the width of the terminal segment; ♀ ovipositor short. Legs black, nitidous, with a dense black pubescence; tibial spurs short, black; pulvilli pallid. Wings smoky-brown, with a somewhat greyish tint,

* Macquart in his description says, "moitié antérieure du thorax d'un noir mat."

darker anteriorly; in the ♂ a little longer than the abdomen, in the ♀ longer than the whole body and considerably wider than those of the ♂; stigma tolerably distinct in the ♂, paler in the ♀; veins umber-brown. The costal, auxiliary, first and second longitudinal, and marginal cross-vein much darker than the rest. Auxiliary vein joining the costa a little before the base of the third sub-marginal cell; anterior branch of the second longitudinal vein reaching the costa a short distance beyond the tip of the first longitudinal; costal vein extending beyond the tip of the second longitudinal vein about half-way from that to the tip of the anterior branch of the third longitudinal fork; petiole of the latter half the length of the marginal cross-vein; marginal cross-vein straight, its base immediately opposite the tip of the posterior branch of the fourth longitudinal; middle cross-vein originating near the base of the anterior branch of the fork of the fourth longitudinal vein, joining the second longitudinal much beyond the apex of the marginal cross-vein; fifth longitudinal vein complete.

Hab.—Tasmania (Macquart); Sydney (Novara Exp., 1 specimen), common (Masters and Skuse); Blue Mountains, and many other localities (Masters and Skuse). September to January.

Obs.—Dr. Schiner first identified the above species as *P. dimidiata*, Macq., from a single ♂ specimen obtained here by the "Novara" expedition; he did not, however, re-describe the species. I have not the least doubt about the identity of the New South Wales and Tasmanian species, though Macquart's description of the latter is far from satisfactory.

Genus 3. DILOPHUS, Meig.

Dilophus, Meigen, Illig. Mag. II. 1803, p. 264, No. 25; Syst. Besch. I. 1818, p. 305; Macquart, S.à B. Dipt. I. 1834, p. 176.

"Head almost entirely occupied by the eyes in the ♂, very small and inclined in the ♀. Palpi 5-jointed; third joint dilated.

Antennæ cylindrical, inserted beneath the eyes; 11-jointed; third joint a little larger than the others; last four joints little distinct one from another. Eyes hairy in the ♂. Prothorax elevated, with two ranges of spines. Legs hairy; fore femora thick, grooved; tibiæ spined in front, and terminated with a coronet of eight spines; tarsi with three pulvilli. No discoidal cell to the wings."

Obs.—*Dilophus longirostris* does not differ from the above in the number of the joints to the antennæ, both ♂ and ♀ being 2-+9-jointed; but in *D. pictipes* (♂) they are 2-+7-jointed, the second basal joint globose and larger than the first joint of the flagellum, the last three joints of the latter being more closely united to one another. In *D. longirostris* the joints of the palpi are much more dilated than in *D. pictipes*, those of the latter being as follows: First joint small, cylindrical; second, third, and fifth joints twice the length of the first, rather thicker, the former two somewhat pyriform, the fifth joint oblong-oval; fourth joint rather more robust than the rest, obovate. Ocelli three, arranged in a triangle on the front. Abdomen with eight segments.

About fifty species are known. The genus has a wide distribution; the majority of species stand recorded from Europe and North and South America.

187. *DILOPHUS LONGIROSTRIS*, Macquart. (Pl. xxxix., fig. 7, ♀).

Dilophus longirostris, (♂ and ♀), Macquart, Diptères Exotiques, 4th Suppl. 1850, p. 17, No. 4, tab. 1, fig. 8.

♂.—Length of antennæ.....	0.020 inch	...	0.50 millimètre.
Expansion of wings.....	0.160 × 0.060	...	4.06 × 1.54
Size of body.....	0.210 × 0.025	...	5.33 × 0.62
♀.—Length of antennæ.....	0.018 inch	...	0.47 millimètre.
Expansion of wings.....	0.180 × 0.065	...	4.56 × 1.66
Size of body.....	0.200 × 0.030	...	5.08 × 0.76

♂ and ♀.—Antennæ very short, black 2- + 9-jointed; in the ♂ inserted near the base of the proboscis, in the ♀ at about one-third of its length. Head, eyes, proboscis and palpi black; front nitidous. Proboscis the length of the head. Palpi inserted near the extremity of the proboscis; first joint very small, second pyriform, third dilated, larger than the rest, fourth sub-globose, fifth almost elliptical, rather smaller than the last. Thorax, pleuræ, pectus, scutellum and metathorax black, nitidous, with pale yellow hairs; the two ranges of prothoracic spines better developed in the ♀. Halteres black, the stem more or less testaceous. Abdomen black, somewhat shining, clothed with pale yellow hairs, the latter much larger in the ♂ than in the ♀; in the ♂ slender, twice the length of the thorax, in the ♀ almost the width of the thorax and twice its length; terminal lamellæ of the ovipositor black. Legs black; in the ♀ the fore coxæ and femora more or less testaceous, tibiæ brown. Fore femora shorter and broader than the other pairs, about half the length and twice the breadth of the hind pair; the latter claviform. Fore and intermediate tibiæ short; fore pair with two spines near the base, and three at the middle, on the front, also a coronet of spines at the apex, these much more distinct in the ♀ than the ♂; intermediate tibiæ of the ♀ with an apical coronet of weak spines. In the ♂ the first four tarsal joints of the hind-legs enormously dilated, particularly the first joint, which is much wider than the femora of the same legs, second joint about the width of the apex of the tibiæ, the rest decreasing in size; in the ♀ the tarsal joints of all legs very slender. Wings longer than the abdomen; in the ♂ hyaline, in the ♀ with a pale yellow tint; stigma prominent, brown; costal, first, and second longitudinal, and marginal cross-vein brown, the rest pale; pubescence extremely microscopic; opaline reflections. Costal vein extending beyond the tip of the second longitudinal vein not half-way from that of the tip of the anterior branch of the fork of the third longitudinal; auxiliary vein long, very indistinct towards its tip; joining the costa immediately beyond the tip of the marginal cross-vein, in

the ♀ the space between the auxiliary and costa deeper yellow than the rest of the wing; sub-costal cross-vein extremely indistinct, situated opposite the base of the anterior branch of the fourth longitudinal; first longitudinal vein disappearing just before the costa, from the marginal cross-vein enveloped in the stigma; base of the marginal cross-vein situate opposite the base of the middle cross-vein; tip of the second longitudinal vein somewhat nearer the apex of the wing than the tip of the posterior branch of the third longitudinal fork; middle cross-vein issuing from the anterior branch of the fourth longitudinal vein opposite the tip of the posterior branch, joining the third longitudinal at the base of the fork; fifth longitudinal vein long, indistinct, not reaching the wing-border.

Hab.—Tasmania (Macquart); Gawler, South Australia.

Obs.—I find eight ♀'s and one ♂ in the Macleay collection labelled Gawler, South Australia, which undoubtedly belong to the species originally described from Tasmania.

188. *DILOPHUS PICTIPES*, sp.n. (Pl. xxxix., fig. 8).

♂.—Length of antennæ.....	0·010 inch	...	0·25 millimètre.
Expanse of wings.....	0·105 × 0·035	...	2·67 × 0·88
Size of body.....	0·120 × 0·015	...	3·04 × 0·38

Antennæ very short, black, 2-+7-jointed. Head, eyes, and palpi black; the former nitidous. Thorax wholly black, very nitidous, with a few pale yellow hairs. Halteres black, the base of the stem testaceous. Abdomen slender, more than twice the length of the thorax, black, nitidous, tolerably clothed with pale yellow hairs; genitalia hidden. Legs slender, testaceous, the fore coxæ and femora brighter than the rest, and the following umber-brown:—the apical half of the first joint and the whole of the remaining four joints of the fore tarsi, the apical half of the intermediate and hind femora and tibiæ, and the last three joints

of their tarsi. Coxæ and femora of the fore-legs longer and stouter than those of the other legs. Fore tibiæ spined as in *longirostris*, except that the second row of three spines is as near the apex of the tibiæ as the row of two is to the base. All tarsal joints equally slender. Wings about the length of the thorax and abdomen taken together, hyaline; stigma prominent, umber-brown; veins umber-brown, the costal, first two longitudinal veins, and marginal cross-vein rather more distinct than the third and fourth longitudinal veins; auxiliary vein yellow; pubescence extremely microscopic, brilliant green and blue reflections. Costal vein extending beyond the tip of the second longitudinal vein more than half way from that to the tip of the anterior branch of the third longitudinal fork; auxiliary vein long, almost invisible towards the tip, joining the costa immediately beyond the tip of the marginal cross-vein; an almost imperceptible trace of a sub-costal cross-vein situated as in *D. longirostris*; the space between the auxiliary and costa, yellowish; first longitudinal vein disappearing just before the costa from the marginal cross-vein enveloped in the stigma, its tip almost opposite but immediately before the tip of the anterior branch of the fourth longitudinal vein; base of the marginal cross-vein situated opposite that of the middle cross-vein, the latter scarcely visible (totally absent in some specimens); tip of the second longitudinal vein rather nearer the apex of the wing than that of the anterior branch of the fork; middle cross-vein joining the third longitudinal before the base of the fork; fifth longitudinal vein long, very pale, not reaching the wing-border.

Hab.—Knapsack Gully, Blue Mountains (Masters and Skuse).
September.

Genus 4. SCATOPSE, Geoff.

Scatopse, Geoffroy, Ins. II. 1764, p. 545, Le Scathopse noir; Meig. Syst. Besch. I. 1818, p. 299; Macquart, S. à B. Dipt. I. 1834, p. 181.

"Palpi concealed, of one distinct joint. Antennæ cylindrical, 11-jointed; the last four little distinct from one another. Eyes reniform. Wings large; one small linear basal cell; three posterior; second petiolated."

Obs.—*Scatopse* appears to have only one joint in the palpi; I could not discover another joint by repeated dissection. Meigen and Macquart both set down the number of antennal joints at eleven; in my specimens the total is 2-+8-joints, as follows:—Second basal joint larger than the first, the seven following flagellar joints short, transverse, terminal joint the length of three of the seven preceding joints, conical. There are three ocelli arranged in a triangle on the front, and the abdomen is seven-segmented.

The larvæ of *Scatopse* swarm in excrements, and in decomposed vegetable and animal matter. The flies are frequently found upon windows, on leaves of plants, in outhouses and privies, &c.

About sixty species are known, the greater number being European, and excepting the following described the remainder are American.

189. SCATOPSE LONGIPENNIS, sp.n. (Pl. xxxix., fig. 9.)

♀.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expansive of wings.....	0·100 × 0·040	...	2·54 × 1·01
Size of body.....	0·100 × 0·020	...	2·54 × 0·50

Antennæ short, about the length of the head, black, densely covered with a very minute pubescence. Head black, with a very short yellow pubescence. Eyes black. Palpi yellow. Thorax black, nitidous, tolerably covered with a very short yellow pubescence, a yellowish spot behind the origin of each wing at the posterior corners; pleuræ black, nitidous, with a pale yellowish arcuated stripe running towards the fore coxæ; scutellum and metathorax black, nitidous. Halteres yellow, with a few very short hairs. Abdomen black, nitidous, rather densely clothed with

very short yellow hairs. Coxæ black. Femora, tibiæ and tarsi brownish-black, densely covered with very short yellow hairs. Fore coxæ and femora considerably more dilated than the intermediate or hind pairs. All tibiæ of equal thickness, the hind pair longest. Wings the length of the entire body, nearly three times as long as wide, hyaline, yellowish at the root, beautifully iridescent; costal, first and second longitudinal, and marginal cross-vein yellowish-brown, the rest very pale and indistinct. First longitudinal joining the costa at a point one-third the distance from the base of the latter to the tip of the second longitudinal; marginal cross-vein extremely short; costal vein extending slightly beyond the tip of the second longitudinal vein, terminating nearer opposite the tip of the posterior branch of the third longitudinal vein than to the tip of the fourth longitudinal vein; base of the fork of the third longitudinal situated about the middle of the wing, the anterior branch with a short indistinct transverse wing-fold issuing from it not far from the base, reaching half-way across the first sub-marginal cell; fifth longitudinal vein reaching the posterior border much beyond the tip of the first longitudinal vein.

Hab.—Sydney (Skuse). October.

Obs.—This species does not appear common, as I have only seen a single specimen. It is easily distinguished at once from the following by the length of the costal and second longitudinal veins, and the pale stripe on the pleuræ. At first I was inclined to believe this to belong to the cosmopolitan *S. notata*, but it does not quite agree with the description given by Loew (Linn. Ent. 1, 1846, p. 325), though his figure of the wing shows a venation scarcely distinguishable from that presented in the above insect.

190. SCATOPSE FENESTRALIS, sp.n. (Pl. XXXIX., fig. 10, ♀).

♂.—Length of antennæ.....	0·020 inch	...	0·50 millimètre.
Expans of wings.....	0·080 × 0·035	...	2·02 × 0·88
Size of body.....	0·075 × 0·017	...	1·89 × 0·42

♀.—Length of antennæ.....	0·017 inch	...	0·42 millimètre.
Expand of wings.....	0·090 × 0·040	...	2·27 × 1·01
Size of body.....	0·080 × 0·020	...	2·02 × 0·50

♂ and ♀.—Antennæ black, with a hoary reflection, densely pubescent, rather thicker in the ♀; in the ♂ the length of the head, longer in the ♀. Entire head, eyes, and palpi black. Thorax black, sub-nitidous, densely covered with a very short black pubescence; pleuræ, scutellum and metathorax black. Halteres black. Abdomen black, sub-nitidous, densely clothed with very short black hairs. Coxæ, femora and tibiæ black, the genua yellowish. Tarsi ochraceous-brown. The coxæ and femora more dilated, and the latter shorter than the intermediate and hind pairs. Wings somewhat longer than the body, a little more than twice as long as wide, less in the ♂ than the ♀, hyaline, with brilliant opaline reflections; costal, first and second longitudinal, and marginal cross-vein yellowish-brown, the rest very pale and indistinct. First longitudinal vein joining the costa at a point rather more than one-half the distance from the base to the tip of the second longitudinal vein; marginal cross-vein extremely small; costal vein extending almost imperceptibly beyond the tip of the second longitudinal, reaching the middle of the anterior border, and a little before the tip of the fourth longitudinal vein; base of the fork of the third longitudinal situated about the middle of the wing, the anterior branch without the short transverse wing-fold appearing in *S. longipennis*; fourth longitudinal not reaching the wing border; wing-fold between the third and fourth longitudinal veins forked; fifth longitudinal complete, reaching the posterior border opposite the tip of the first longitudinal vein.

Hab.—Apparently generally distributed in N.S. Wales (Masters and Skuse). Throughout the year; very abundant in September and October.

Obs.—In the spring months it is scarcely possible to find a window without one or two specimens, while I have frequently

seen hundreds swarming on the inside of shop windows in Sydney. One specimen taken by me on May 9th, after being subjected to chloroform and gummed on card, deposited in a quarter of an hour about 250 eggs, almost in one continuous string. The eggs are white, shining, translucent, more than twice as long as wide, rather larger at one end, 0.007 long \times 0.003 mm. wide.

EXPLANATION OF PLATE.

PLATE XXXIX.

- Fig. 1. Wing of *Simulium furiosum*, 1a palpus, 1b antenna.
 Fig. 2. „ *Bibio imitator* (♂).
 Fig. 3. „ *Plecia amplipennis* (♀).
 Fig. 4. „ „ *ornaticornis* (♂).
 Fig. 5. „ „ *erebea* (♂).
 Fig. 6. „ „ *dimidiata* (♂).
 Fig. 7. „ *Dilophus longirostris*, (♀).
 Fig. 8. „ „ *pictipes* (♂).
 Fig. 9. „ *Scatopse longipennis* (♀).
 Fig. 10. „ „ *fenestralis* (♀).